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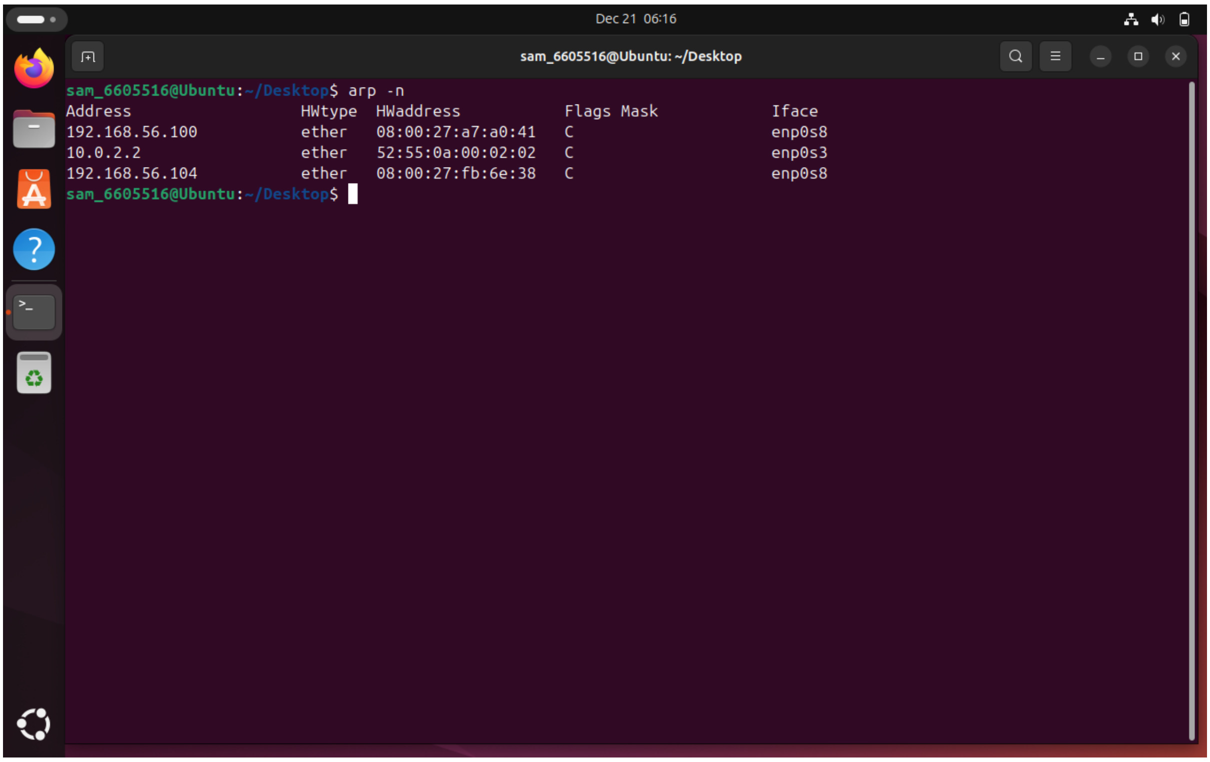
Group: G4 3rd sem

PROJECT TITLE: ARP Spoofing Attack Demonstration

Project description: This project demonstrates an ARP Spoofing (ARP Poisoning) attack in a controlled virtual lab to highlight security weaknesses in the Address Resolution Protocol (ARP). Since ARP does not authenticate responses, it can be exploited to perform Man-in-the-Middle (MITM) attacks.

1.ARP table before communication

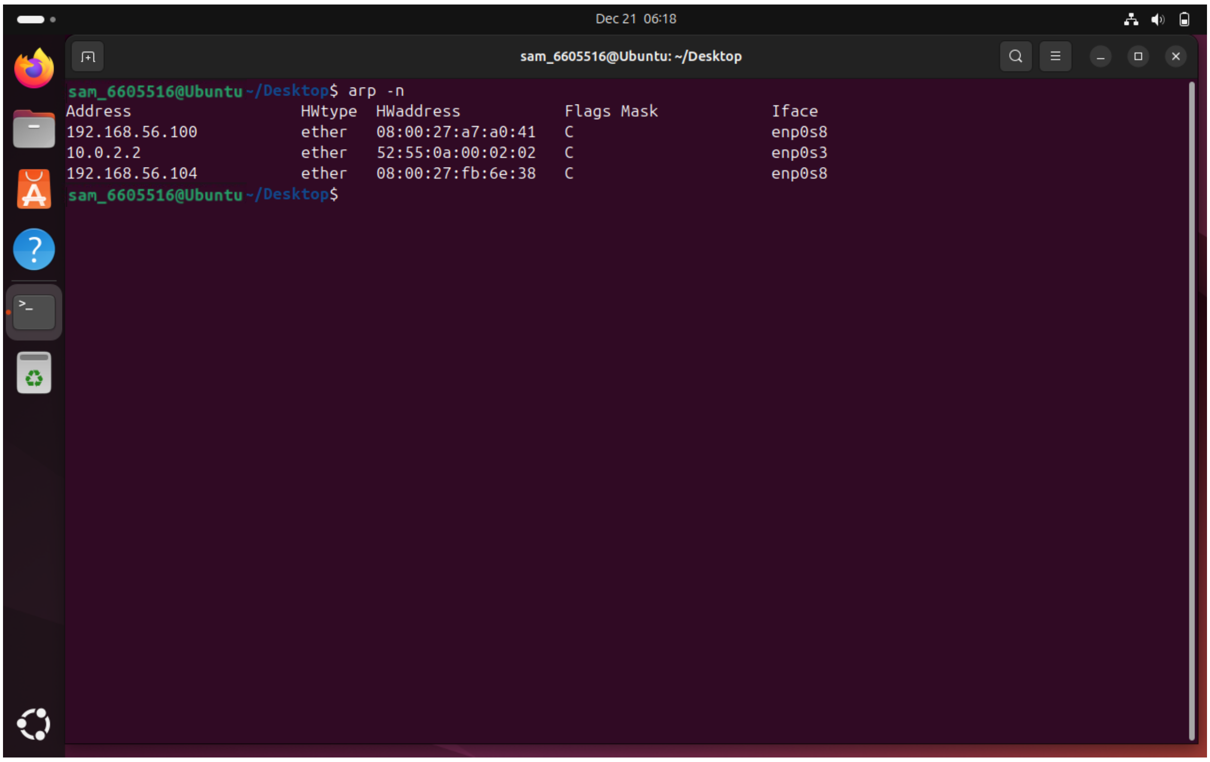
This section shows the ARP table before any active communication with the gateway. Only previously known IP–MAC address mappings are present. This represents a normal and stable ARP state.



```
sam_6605516@Ubuntu:~/Desktop$ arp -n
Address                  HWtype  HWaddress           Flags Mask            Iface
192.168.56.100           ether   08:00:27:a7:a0:41   C                     enp0s8
10.0.2.2                 ether   52:55:0a:00:02:02   C                     enp0s3
192.168.56.104           ether   08:00:27:fb:6e:38   C                     enp0s8
sam_6605516@Ubuntu:~/Desktop$ 
```

2. ARP table after normal ping

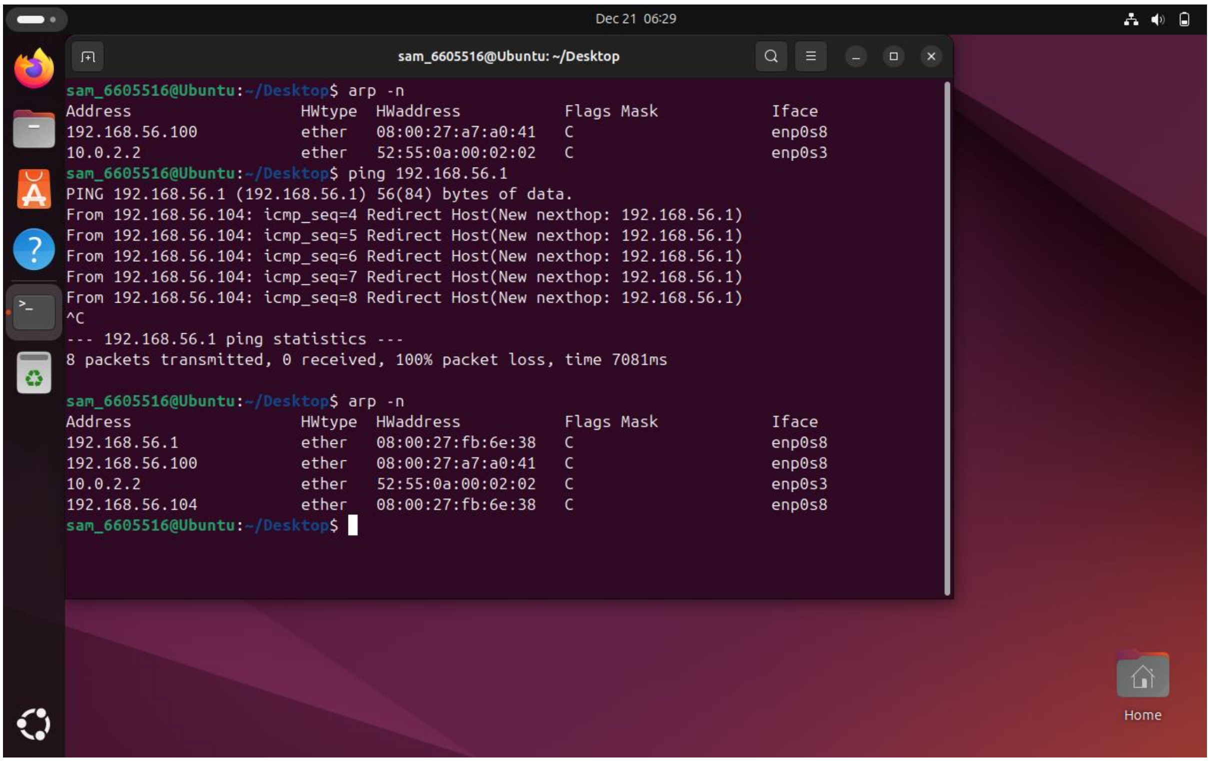
After the communication attempt, the ARP table updates automatically. New entries appear as the system resolves MAC addresses for recently contacted IPs. This reflects dynamic ARP behaviour in real-time network communication.



```
sam_6605516@Ubuntu:~/Desktop$ arp -n
Address                  HWtype  HWaddress           Flags Mask            Iface
192.168.56.100           ether   08:00:27:a7:a0:41   C                     enp0s8
10.0.2.2                 ether   52:55:0a:00:02:02   C                     enp0s3
192.168.56.104           ether   08:00:27:fb:6e:38   C                     enp0s8
sam_6605516@Ubuntu:~/Desktop$
```

3.Successful ARP Spoofing Evidence

In this stage, abnormal network behaviour is observed. When a ping request is sent to the gateway (192.168.56.104), ICMP Redirect Host messages appear. This indicates routing confusion or possible ARP spoofing activity, where traffic is being redirected incorrectly.



```
sam_6605516@Ubuntu:~/Desktop$ arp -n
Address                  HWtype  HWaddress           Flags Mask            Iface
192.168.56.100           ether   08:00:27:a7:a0:41   C                     enp0s8
10.0.2.2                 ether   52:55:0a:00:02:02   C                     enp0s3
sam_6605516@Ubuntu:~/Desktop$ ping 192.168.56.1
PING 192.168.56.1 (192.168.56.1) 56(84) bytes of data.
From 192.168.56.104: icmp_seq=4 Redirect Host(New nexthop: 192.168.56.1)
From 192.168.56.104: icmp_seq=5 Redirect Host(New nexthop: 192.168.56.1)
From 192.168.56.104: icmp_seq=6 Redirect Host(New nexthop: 192.168.56.1)
From 192.168.56.104: icmp_seq=7 Redirect Host(New nexthop: 192.168.56.1)
From 192.168.56.104: icmp_seq=8 Redirect Host(New nexthop: 192.168.56.1)
^C
--- 192.168.56.1 ping statistics ---
8 packets transmitted, 0 received, 100% packet loss, time 7081ms

sam_6605516@Ubuntu:~/Desktop$ arp -n
Address                  HWtype  HWaddress           Flags Mask            Iface
192.168.56.1             ether   08:00:27:fb:6e:38   C                     enp0s8
192.168.56.100           ether   08:00:27:a7:a0:41   C                     enp0s8
10.0.2.2                 ether   52:55:0a:00:02:02   C                     enp0s3
192.168.56.104           ether   08:00:27:fb:6e:38   C                     enp0s8
sam_6605516@Ubuntu:~/Desktop$ 
```

4.CONCLUSION

- ARP dynamically maps IP addresses to MAC addresses.
- Network communication triggers ARP table updates.
- ICMP Redirect messages suggest abnormal routing behaviour.
- Monitoring ARP tables is important for detecting network issues and security threats.